

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A water-based, recyclable metalworking fluid comprising:

water;

a water-soluble polyalkylene glycol lubricating agent;

an alkanolamine;

a polyglycol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent;

a polyol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent and said polyglycol surfactant;

a biocide; and

a corrosion inhibitor;

said fluid being further characterized in that it is free of fatty acids.
2. (Original) The metalworking fluid of claim 1, further including an isoalkyloxy amine oxide.
3. (Original) The metalworking fluid of claim 1, further including a benzotriazole salt.
4. (Original) The metalworking fluid of claim 1, wherein said alkanolamine comprises a mixture of alkanolamines.

5. (Original) The metalworking fluid of claim 1, wherein said alkanolamine is selected from the group consisting of: triethanolamine, diethanolamine, monoisopropanolamine, diisopropanolamine, triisopropanolamine, and combinations thereof.

6. (Original) The metalworking fluid of claim 1, wherein said biocide comprises a mixture of biocidal materials, said mixture having an antibacterial and an antifungal effect.

7. (Original) The metalworking fluid of claim 6, wherein said mixture of biocidal materials includes at least one morpholine compound.

8. (Original) The metalworking fluid of claim 6, wherein said mixture of biocidal materials includes poly(oxy-1,2-ethanediyl(dimethylimino)-1,2-ethanediyl(dimethylimino)-1,2-ethanediyl dichloride).

9. (Original) The metalworking fluid of claim 1 characterized in that it is free of phenols.

10. (Canceled)

11. (Original) The metalworking fluid of claim 1, wherein said polyglycol surfactant comprises a polyoxypropylene-polyoxyethylene block copolymer.

12. (Original) The metalworking fluid of claim 1 wherein the polyol surfactant comprises poly(oxy-1-2-ethanediyl),alpha-(4nonylphenyl)-omegahydroxy branched.

13. (Currently Amended) A water-based, recyclable metalworking fluid comprising, on a weight basis:

12-14% of a water-soluble polyalkylene glycol lubricating agent;

1-15% of an alkanolamine;

5-7% of a polyglycol surfactant having a composition which differs from that of said polyalkylene glycol surfactant;

.5-1.0% of a polyol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent and said polyglycol surfactant;

10-30% of a corrosion inhibitor;

.5-1.0% of a biocide; and

the remainder, water;

said fluid being further characterized in that it is free of fatty acids.

14. (Original) The metalworking fluid of claim 13, further including, on a weight basis: 10-12% of isoalkyloxy amine oxide.

15. (Original) The metalworking fluid of claim 13, further including, on a weight basis: 1.5-2% of a benzotriazole salt.

16. (Original) The metalworking fluid of claim 13, wherein said biocide comprises a mixture of biocidal materials, said mixture having antibacterial and antifungal effects.

17. (Original) The metalworking fluid of claim 16 wherein said mixture of biocidal materials includes, on a weight basis, .35-.5% of a morpholine compound.

18. (Original) The metalworking fluid of claim 16, wherein said mixture of biocidal materials includes, on a weight basis, .5-1.0% of poly(oxy-1,2-ethanediyl(dimethylimino)-1,2-ethanediyl(dimethylimino)-1,2-ethanediyl dichloride).

19. (Original) The metalworking fluid of claim 13, further including a material selected from the group consisting of: surfactants, antifoaming agents, coloring agents, fragrances, viscosity control agents, and combinations thereof.

20. (Original) The metalworking fluid of claim 13, wherein the alkanolamine component comprises 13-15% of the composition.

21. (Original) The metalworking fluid of claim 13, wherein the corrosion inhibitor comprises 8-10% of the composition.

22. (Currently Amended) A method for shaping a metal workpiece, said method including the step of:

contacting said workpiece with a water-based, recyclable metalworking fluid, while said workpiece is being shaped, said fluid comprising:

a water-soluble polyalkylene glycol lubricating agent;

an alkanolamine;

a polyglycol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent;

a polyol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent and said polyglycol surfactant;

a biocide; and

a corrosion inhibitor;

said fluid being further characterized in that it is free of fatty acids.

23. (Original) The method of claim 22, including the further steps of:

collecting spent metalworking fluid; and

recycling said spent metalworking fluid.

24. (Original) The method of claim 22, wherein said workpiece comprises leaded brass, and wherein said method of shaping comprises cutting said leaded brass workpiece.

25. (Original) The method of claim 22, wherein said fluid comprises, on a weight basis:

12-14% of said polyalkylene glycol;

1-15% of said alkanolamine;

5-7% of said polyglycol surfactant;

.5-1.0% of said polyol surfactant;
10-30% of said corrosion inhibitor;
.5-1.0 % of said biocide; and
the remainder water.

26. (Original) The method of claim 25, wherein said metalworking fluid further includes, on a weight basis, 10-12% of isoalkyloxy amine oxide.

27. (Original) The method of claim 25, wherein said metalworking fluid further includes, on a weight basis, 1.5-2% of a benzotriazole salt.

28. (New) A water-based, recyclable metalworking fluid comprising:
water;
a water-soluble polyalkylene glycol lubricating agent;
an alkanolamine;
a polyglycol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent;
a polyol surfactant having a composition which differs from that of said polyalkylene glycol lubricating agent and said polyglycol surfactant;
a biocide;
a corrosion inhibitor; and
an isoalkoxy amine oxide.